Sine Wave Solar UPS

Owner's Manual

KSU 1024S, KSU 2048S

Thank you for choosing the intelligent NON STOP Solar UPS with state of art technology.

Please read this guide carefully before installing the product.

Should you have any queries & suggestions please call on us. We will be happy to provide the assistance that you are looking for.

We wish you years of joyful homemaking with the NON STOP UPS & look forward to a great association with you.

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Over view

A UPS is an electrical apparatus which is interfaced between the electric network and the appliances that need to be protected from power uncertainties like power outages, over voltages, under voltages, power line disturbances and surges.

The UPS have the battery source which gets charged when the mains power is available and provides the back up power from the battery when the mains is not available, ensuring uninterruptible power supply.

The intelligent Sine wave Solar UPS with state of the art technology provides following key functionalities:

When the solar power and mains power are available, battery will be charged by solar panel. If the battery voltage is too low, then it will also charge the battery through mains power.

When the mains power and solar power are available, the load will be powered by Solar power. If the load requirement is more than the available solar power then the battery will supply the additional load.

When solar power is not available , the grid power will charge the battery & supply the load like any conventional UPS.

It is compact & lighter than any other UPS in its class.

Applications

- Power back up for your home
- Domestic computer and its peripherals
- Emergency power systems
- Photography
- Small water pumps and all motor based small applications
- Television, Fans & Tube-lights
- Professional applications where waveform is critical

Key Features

- MCU control guarantees high reliability
- Pure Sine wave output
- Compact and light weight
- Simple & easy installation
- High efficiency & longer back up time
- Intelligent charging ensuring more battery life
- Normal & Computer mode operation of the UPS
- 10% more solar energy is harvested by using MPPT solar charger
- Auto priority logic to charger from both mains & solar simultaneously.
- No load sleep: If the load is less than 20W, the inverter will go to automatic sleep and save power
- Auto wakeup : Inverter will switch on automatically when the battery is charged by solar to predetermined level.
- Phase reversal protection
- Overload protection & auto recovery
- Short circuit protection
- Liquid crystal display for UPS status monitoring

Technical Specification

Mains Input

Model →		**KSU 1024S+**	**KSU 2048S+**
Nominal input	:	230V AC, 50 Hz	
Input voltage lower cut off			
o Computer mode	:	175 V AC	
o Normal mode	:	125 V AC	
Input voltage higher cut off	:	270 V AC (configurable)	
Input connection	:	3 pin plug (15A)	

Output

Model →		**NS 1024S+**	**NS 2048S+**
Inverter Mode			
Out put voltage (VAC)	:	208-230	
Out put power (VA/Watt)	:	1000/1000	2000/2000
Out put frequency (Hz)	:	49.0 – 51.0	
Out put voltage wave form	:	Pure Sine wave	
Out put connection	:	6A outlet	15A outlet
Efficiency (%)	:	80%	82%
Mains Mode	:		
Out put voltage (VAC)		Same as input	
Efficiency (%)	:	>96%	
Transfer time	:	<10 milliseconds	
LCD indication	:	Status of UPS/Solar charger, Solar generated power	
Audible Alarm		Battery low Mode changeover	
Nose Level	:	<50 dB	
Battery voltage (V)	:	24	48
Battery capacity - Recommended (AH)	:	300X2	300X4
Typical Low battery Alarm Voltage (V)	:	22.0	44.0
Typical Shut down battery voltage (V)	:	21.6	43.2

MPPT Solar charger
(Intelligent maximum power point tracking (MPPT) technology)

Model →		**NS 1024S+**	**NS 2048S+**
Battery charging current (A)	:	40	40
Maximum solar input power(W)	:	1000	2000
Peak charger efficiency	:	98%	
Max Solar open circuit voltage (V)	:	85	120

Protection

- Lightening, battery over voltage, battery under voltage, battery wire removal, out put short circuit, over load, phase reversal.

Physical

1024S+

- Dimension : 355×144×215 mm
- Net weight: 6.5Kg.

2048s+

- Dimension : 478×191×339 mm
- Net weight: 16Kg.

Environment

- Humidity : 0- 90 % RH
- Operating temperature: 0-45 ºC

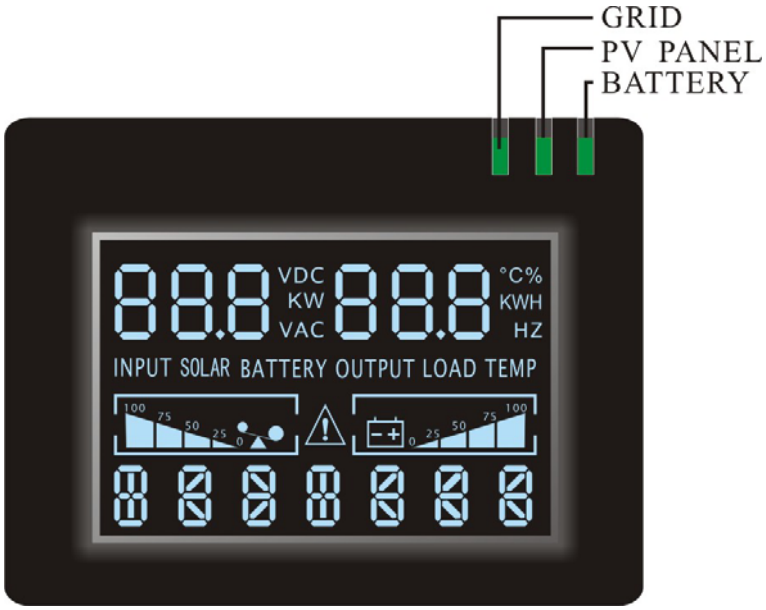
Note: Specifications are subject to change without prior notice.

Physical Description

Below Figure shows the 3D view of the Solar UPS.
The product has the metallic enclosure. Adequate cooling fans are provided for thermal management. Front panel has a LCD to indicate the instantaneous status of the product. Front panel switch is provided to select different operating modes.

Front panel

LCD PART



The first line is digital section， and is consisted of two small numeric sections and the related unit section on the right side. It is used to display the numerical value of the certain item on the second line.

The second line is the item section, includes input, solar, battery, output, load and temperature etc.

The third line is the graphic section which has the load (left) and battery capacity (right) displayed in graphics. The failure icon will be displayed when there is a failure.

The fourth line is the status section, and is the area of machine status in English. The detail is descript in the below LCD displayed status table.

LED PART I

Line status LED： When Line is OK ,the LED light on.

PV Panel LED： When PV panel is OK , the LED light on.

Battery status LED： When battery voltage is OK, the LED light on, when battery low ,the LED blink.

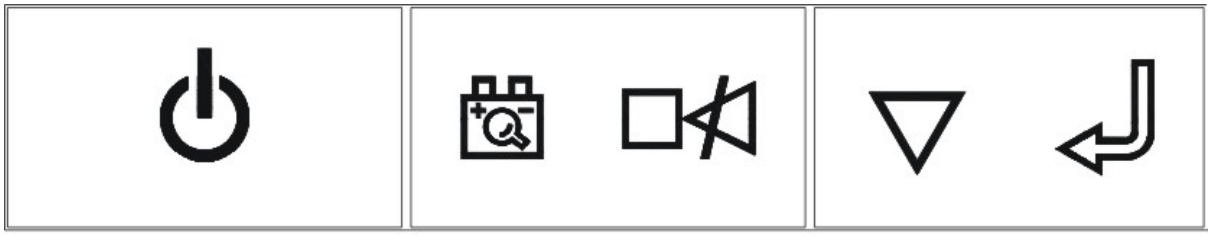
LED PART II

Inverter status LED： When Inverter takes load, the LED light on.

Bypass status LED： When Bypass takes load, the LED light on.

Fault status LED： When UPS fail, the LED light on.

BUTTON PART



Button function description

Power On button

When there is only battery connected, press this button to power on the solar UPS.

Function button

Not used.

Query button

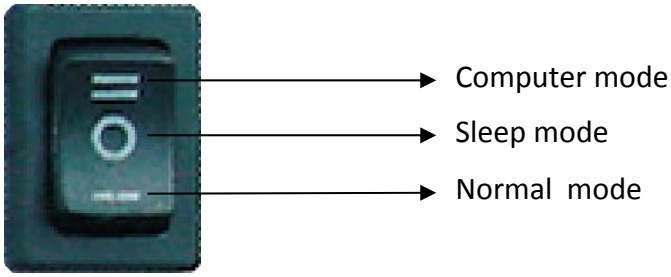
Short press， it will in turn shows the items in the second row of display. Long press, it goes to rotational shows and the items will alternately show every 2s and the turns are: “Input, Solar, Battery, Output, Load and Temperature”. When long pressing the button again, it will turns to display output and PV generated power.

LCD displayed status :

Information on LCD	**Meaning**
MNS ON	Power supply from mains is available.
MNS OFF	Power supply from mains is not available.
MPPT ON	Solar power is available
MPPT OFF	Solar power is not available
MPPT FLT	MPPT charger is not functioning
INV ON	The Inverter is functioning.
UPS BPS	The Inverter is OFF, load is take by mains
CHG ON	Battery is getting charged by mains.
CHG OFF	Battery is not getting charged by mains.
UPS OFF	UPS is in sleep mode and not goes to Inverter mode during mains power is off.
UPS FAIL	UPS is not working. LCD displays an error code .
LOAD HI	UPS is over loaded. It restarts for 6 times with an alarm. If the load is reduced with in this period it will restore normal functioning. Else, It will shut down with a trip message to protect itself from continuous overloading.

Information on LCD	Meaning
OP SHORT	UPS output is short circuited. It will shut down with a trip message to protect itself from short circuit.

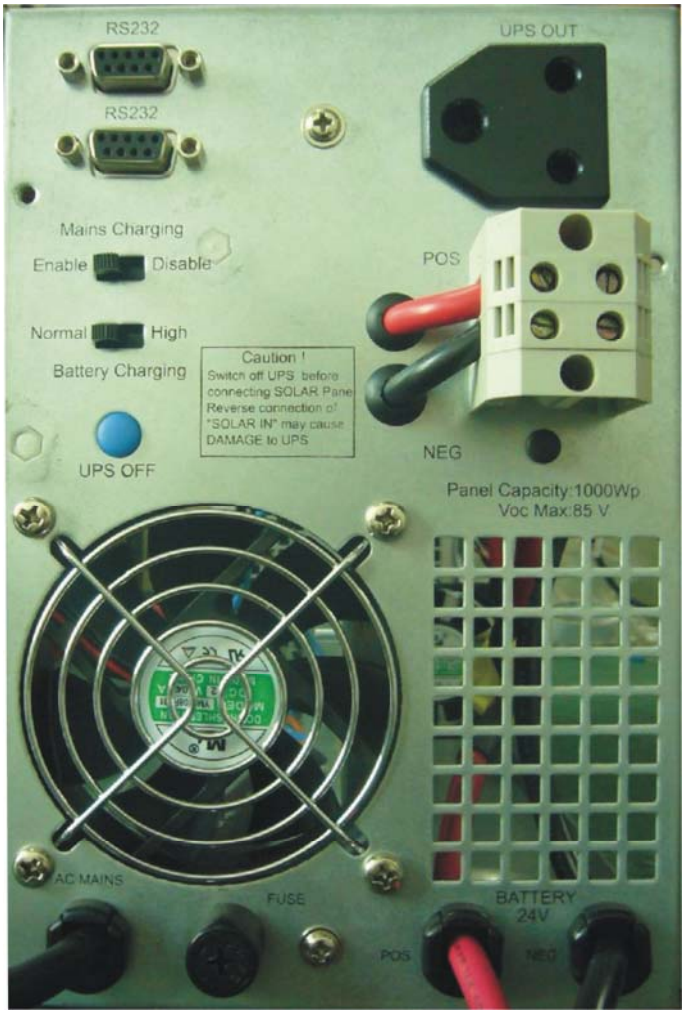
Switch:



The functions of each mode are given below :

Switch position	Type of mode	Description
Top (=)	Computer mode	UPS switches to Inverter mode when the mains voltage goes below 175 V and above 270V.
Middle(o)	Sleep mode	Mains ON : UPS is in bypass mode & battery will be charging. Mains OFF : UPS will be idle and battery will be charging by Solar.
Bottom (-)	Normal mode	UPS switches to Inverter mode when the mains voltage goes below 125 V and above 270 V

Rear panel



Name	**Description**
FUSE	Connected at mains input & protects the UPS from electrical surges. Always use the rated fuse.
AC MAINS	Mains input to UPS. Connected through the power cord with 15 A, 3 pin plug.
UPS OUT	The output of the UPS for load.
BATTERY – POS	The positive (RED) terminal is extended from the UPS to connect to the positive end of the battery.
BATTERY – NEG	The negative (BLACK) terminal is extended from the UPS to connect to the negative end of the battery.
BAT CHARGE- NORM	Normal battery charging current. Set when 120 AH or less capacity battery is used.

Name	Description
BAT CHARGE- HIGH	High Battery charging current. Set when 150AH or more capacity battery is used.
BAT CHARGE-ENABLE	To enable the charging from mains
BAT CHARGE-DISABLE	To disable the charging from mains
SOLAR IN -POS	Connection to positive terminal of Solar module.
SOLAR IN -NEG	Connection to negative terminal of Solar module.
UPS OFF	Press this switch momentarily for 2-3 seconds to completely shutdown the solar UPS . Condition: PV NG & Mains off & front panel switch is in sleep mode.

Safety Instructions

- Always disconnect the battery cables of the UPS only after turning the UPS into sleep mode & disconnecting the UPS from AC mains.
- Connecting the battery terminals usually create an arc. This is normal.
- Connect the battery terminals firmly to ensure no loose contacts.
- Follow battery manufacturer's instructions carefully.
- Do not allow the UPS to be exposed to flammable liquids, rain, excessive heat or direct sunlight.
- Connect the UPS to a grounded power outlet.
- Always use rated fuse.
- While going out on vacations keep the UPS in sleep mode & Solar module connected to keep the battery in charged condition.
- Place the UPS in an adequate airflow and dust free area.
- Maintenance must be performed by a qualified personnel. Failure to do so could result in electric shock.
- Use tools with insulated handles during installation and maintenance to avoid personnel injury.

Installation

Package content:

- Solar UPS - one unit
  (with battery cable & Mains cord)
- Owner's Manual with Warranty card
- Spare fuses
- Battery interconnect cable
  (for more than one battery option)

Installation Procedure

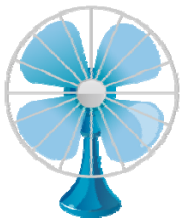
- Turn the front panel switch to sleep mode
- Connect the positive and negative terminals of the battery to the respective battery cable of the UPS.
- Connect the positive and negative terminals of the solar panel to the respective terminals of the SOLAR IN located at rear panel.
- Connect the mains cord of the UPS to 15 A mains outlet.
- It is recommended that before connecting to the load charge the battery for a minimum period of 8 hours.
- Plug your peripheral equipment / appliances to "UPS OUT"
- Turn the front panel switch to Normal mode. Turn it to computer mode if computers are part of the load.
- Ensure that the connected load is with in the rated limit.

Warning!:

- *Ensure that battery connections are made with correct polarity.*
- *Ensure that Solar panel connections are made with correct polarity.*
- *Ensure that Solar terminals are not shorted while MPPT is ON.*

Failed to do so may cause damage to UPS.

Load Chart

Appliance	Typical Load	NS 1024S+		NS 2048S+	
		A	B	A	B
Fan 	75W	6	4	12	8
Tube light	40W	7	5	13	10
Television	125W	1	0	2	0
Computer	150W	1	3	2	6
Printer	40W	0	1	1	2

Trouble shooting

Sl.No.	Problem	Remedy
1	AC mains not available to the UPS	1) Check the power from the mains socket. 2) Check the fuse at the rear. If the fuse has blown, change it with specified rated fuse.
2	Inverter not working	1) Battery is low. 2) Battery terminals are loose. Tight them. 3) Front panel switch is in sleep position. Turn it to Normal or Computer position.
3	Inverter intermittently trips	UPS might be overloaded. Reduce the load, turn the front panel switch, then it resumes to the normal operation.
4	Battery low	Recharge the battery for minimum 8 hours to restore 90 % of the capacity
5	Battery not charging	1) Battery terminals are loose. 2) Check the distilled water level. If not ok, fill it.
6	Less back up time	1) Check the distilled water level. If not ok, fill it. 2) Charge the battery with mains for minimum 8 hours. If still the back up time is less, check the battery by authorized service personnel.
7	The solar panel is connected but the LCD shows SOLAR OFF	1) Check the solar panel to UPS cable Connection. 2) Check the solar panel is clean and uncovered.

Note: If the problem still persists call the service centre.

Error Messages

On rear occasions, you may notice certain error codes on the top right side of LCD. These error codes may be interpreted as below.

Shut down the UPS immediately & call the service centre.

Error code	Meaning
04	Internal temperature of UPS is very high.
02	Output short.
01	Output overload timeout.
16	Inverter fail.
32	Booster fail.
08	Over Charge.

Warranty Card

Customer Name:	
Address:	
UPS Model:	
UPS Sl. No.	
Solar panel (Make , Model & Sl No)	
Battery (Make , Model & Sl No)	
Invoice No & Date	
Dealer's Name, Address & Contact No.	
Dealer's stamp & Signature	
Manufactured By:	

The End